

RELEASE AUTHORISATION

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INDIAN PLYWOOD INDUSTRIES RESEARCH AND TRAINING INSTITUTE

(Autonomous body of the Govt. of India, Ministry of Environment, Forests and Climate Change)



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DIRECTOR

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1.0 SCOPE



The quality Manual is prepared based on ISO/IEC 17025:2017 and NABL 160 (issue No.07 and issue date 11.07.2018) for CENTEC Laboratories (Mechanical and Chemical) of IPIRTI. The applicable standards, fields, disciplines, areas, the sections and divisions departments of the CENTEC, IPIRTI are given in the Document: IPIRTI/CENTEC/SCOPE and Annexure 3 of quality manual. The Quality Manual is applicable only for the scope mentioned in the Document: IPIRTI/CENTEC/SCOPE and not applied for other areas of CENTEC Laboratories (Mechanical and Chemical) of IPIRTI .

This document specifies the general requirements for the competence, impartiality and consistent operation of laboratories. This document is applicable to all for laboratory activities, regardless of the number of personnel. Laboratory customers, regulatory authorities, organizations and schemes using peer-assessment,

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ABBREVIATIONS



Abbreviations	Description
AO	Administrative Officer
CENTEC	Center for Testing and Evaluation of Wood Composites
QP	Quality Procedures
HOD	Head of Department
IPIRTI	Indian Plywood Industries Research and Training Institute
IS	Indian Standard
ISO	International Organization for Standardization
BIS	Bureau of Indian Standards
NABL	National Accreditation Board for Testing and Calibration Laboratories
NCR	Non Conformity Report
NPL	National Physical Laboratory
QM	Quality Manual
QMR	Quality Manager
QMS	Quality Management System
TM	Technical Manager
MR	Management Review

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DISTRIBUTION LIST

The following are the authorized holders of the controlled copy of Quality Manual.

Controlled Copy No.	Name/ Designation of the holder of controlled copy
IPIRTI/QM 01	Quality Manager
IPIRTI/QM 02	Director
IPIRTI/QM 03	Joint Director
IPIRTI/QM 04	Technical Manager (Mechanical)
IPIRTI/QM 05	Technical Manager (Chemical)
IPIRTI/QM 06	Administrative Officer
IPIRTI/QM 07	Accreditation officer, NABL, QCI, New Delhi

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2.0 INTRODUCTION



INDIAN PLYWOOD INDUSTRIES RESEARCH AND TRAINING INSTITUTE (IPIRTI)

The Institute was established in the year 1962 as a cooperative research laboratory of the Indian Plywood Manufacturers' Research Association with participation of CSIR in recognition of the need for a Research and Development Institute for plywood industries in the country and to conduct applied research on plywood, an important wood based panel material. It was christened Indian Plywood Industries Research Institute (IPIRI) during 1970.

In pursuance of the decision by the Union Cabinet to transfer several Laboratories/Museums/Cooperative Research Laboratories to various Ministries of the Government of India, IPIRI was transferred to the Department of Industrial Development (Ministry of Industries) Govt. of India. The Institute is an autonomous body has established its credentials as an important center for research in panel products from wood and other lingo-cellulosic materials. Realizing the need for trained manpower of the wood based panel industries, training facilities in mechanical Wood Industries Technology were established during 1988 with FAO/UNDP/GOI assistance.

Its administrative control was transferred to the Ministry of Environment and Forests, Government of India in May 1990. Considering the role-played by the Institute in imparting training, the Institute was renamed IPIRTI (Indian Plywood Industries Research and Training Institute) in 1992. Legally, since its inception, the Institute (also referred to as IPIRTI in this manual) has been functioning as a registered society under the Karnataka Societies Registration Act, 1960. The Institute has its headquarters at Bangalore with outreach field stations, one located at Kolkata and another at Chandigarh.

According to the Memorandum of Association of the Institute, The Union Minister for Environment and Forests is the ex-officio President of the IPIRTI Society. The membership of IPIRTI extends to large, medium and small-scale mechanical wood based industries. In addition, the Union Ministries of Environment and Forests, Industries, Agriculture and Planning, State Government of Karnataka (General superintendence), Bureau of Indian Standards, Federation of Indian Plywood and Panel Industries, ICFRE and ICAR are members of the IPIRTI. The direction and control of the affairs of the Institute are vested with the Board of Governors (BOG) headed by the Secretary, Environment, Forests & Climate change, Government of India. The BOG has representation from Industries, State Forest Development/Industries Corporations and NGOs in addition to 18 official members representing various departments/organizations of Government of India, and the state of Karnataka. Director of the Institute is the Chief Executive officer of IPIRTI Society.

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IPIRTI is especially mandated to undertake



- Research on all aspects of production of sawn timber, manufacturing plywood and other allied engineered and reconstituted wood or lignocellulosic products, including improvement of materials, manufacturing processes, improvement of machines and appliances, conditions of work - time and motion studies - standardization of methods of work -conditioning of factories.
- Inspection, certification and marking of all forest products viz. plywood, wood, timber, hardboard, particleboard, chipboard, furniture, gluelams, compreg, doors, panel doors, block board, flush doors, veneered panels, veneers, laminated panels, composite boards, and the products of allied trade and industry.
- Training on use of forest products in the plywood industry, trade and allied industries.
- Imparting technical education and/or training at undergraduate, postgraduate, and/or any other level in technology of forests products, chemicals and paper laminates, and/or synthetic finishing, manufacturing machinery.

To become an apex institution of international repute to carryout necessary R & D towards advising and/or providing competitive consultancy to the academia as well as wood & other lignocellulosic based panel industry sector regarding the conservation of natural forests through development and adoption of efficient technologies in the field of wood and panel products from renewable fibers including plantation timbers and bamboo while meeting the vital needs of the developing society.

PRODUCT STANDARDIZATION

Standardization facilitates use of right material for right product. It also helps build consumer confidence in any material/product and ensure product quality conforming to the specifications. IPIRTI is very much involved in the activities of BIS related to Standards on Wood and wood based Panels and panels from other lignocellulosic materials including agricultural residues. IPIRTI activities include technical and R & D input and support to the BIS in the formulation of Indian Standards on wood based products and for materials developed at the Institute, rationalization of test procedures and methods and review ISO draft Standards.

The Director, IPIRTI, is the Chairman of wood products sectional committee CED: 20, and the Convener of BIS Committee for matters relating to International Standards on Wood Based Panel Products, for which India is a member in P category. Director is also a member of BIS Civil Engineering Division Council. Scientists of the Institute serve on various sectional committees and sub committees of Civil Engineering Division of BIS as conveners/members.

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TESTING

Testing is one of the main activities of the Institute. The Institute has upgraded its test facility to keep pace with the growing needs and evolving standards. The Institute is equipped with wide range of facilities for testing of wood, wood based panels and panels from other lingo-cellulosics (including agricultural residues), adhesives, adhesive components, preservative chemicals and Identification of timber species as per relevant Internal/National/International Standards. Beneficiaries include Manufacturers, Certifying agencies, Regulating authorities, Traders and Consumers.

IPIRTI is one of the laboratories recognized by BIS and is in the list of specialized national laboratories for testing of wood and wood based panels. BIS is using the services of the Institute for the operation of its product certification scheme for the wood based industries.

Services offered by IPIRTI

IPIRTI is providing services in the fields of

- a) Testing of Wood and Wood Products
- b) Testing of chemicals
- c) Sawmilling
- d) Saw doctoring
- e) Training
- f) Extension
- g) Consultancy
- h) Sponsored Projects

Of the above items (a) & (b) being the major activities of CENTEC are covered in the quality system.



CENTEC – Center for Testing and Evaluation of wood Composites

Considering the importance of testing activity, CENTEC came into existence in September 2002 to give special focus for testing activity. CENTEC is under the aegis of IPIRTI.



It is necessary that all personnel in the laboratory understand and implement the requirements as specified and expected by the standard.

The information about the current Quality Manual are

- a) (i) Current issue number: 08
- (ii) Issue Date: 27.06.2019
- b) The Quality Manual is revised based on the revision of specification by NABL or based on time to time instruction from NABL or based on NCs raised by NABL lead and technical Assessors.
 - (i) Reviewing authority : Director

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- (ii) Time period for Reviewing: 12 months, once during MR meeting or prior to that need-based.
 - (iii) Authorized to change the QM: Director
 - (iv) Approval to change the QM: Director
- c) The Controlled copies of QM are distributed as per page 07 and all the QM are used by authorized persons in the CENTEC labs (Institute)/ IPIRTI, Field Stations/ IPIRTI Head Quarters. As the Institute coming under MoEFCC, Govt. of India it cannot be made available for external use The distribution list of controlled and uncontrolled QM copies are as per document: IPIRTI/QDD.
- d) Only Director is having the authority to approve the contents of the Quality Manual.

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QUALITY POLICY

The Quality policy of CENTEC, IPIRTI, Bangalore is to provide good professional practice with high quality, impartial, reliable and timely testing services complying National/International standards to the full satisfaction and delight of customers. All personnel concerned with testing activities within the CENTEC, Mechanical and Chemical laboratory familiarize themselves with the quality documentation and implement the policies and procedures in their testing work. The top management commits to comply with ISO/IEC 17025:2017 with appropriate test equipment and through technically qualified and competent personnel and strive for the continual improvement of its effectiveness in testing services and CENTEC (Mechanical and Chemical) laboratories management system to enhance its image and reputation.





Director

QUALITY OBJECTIVES

- The test and measurements are carried out fully conforming to relevant specifications.
- The lab equipments kept in fully fit condition to ensure their reliability.
- The lab personnel are fully trained, are aware of test procedures, familiar with the QMS documentation of the lab and conscious of their responsibility to implement the policy and procedures.
- The system affords for early detection and correction of non-conformities.
- The complaints and feed backs, technical in nature or otherwise are acted upon appropriately.
- The customer is associated whenever any request for retest/ witnessing of test is received after granting permission by the Director.
- The management audit and review are planned and conducted to evaluate the continued effectiveness and improvement of the management system of the laboratory.



Director

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4.0 GENERAL REQUIREMENTS

4.1 Impartiality

- 4.1.1 Laboratory activities are undertaken impartially and structured and managed so as to safeguard impartiality.
- 4.1.2 The laboratory management is committed to impartiality.
- 4.1.3 The laboratory is responsible for the impartiality of its laboratory activities and shall not allow commercial, financial or other pressures to compromise impartiality.
- 4.1.4 The laboratory identifies the risks to its impartiality on an on-going basis. This includes those risks that arise from its activities, or from its relationships, or from the relationships of its personnel. However, such relationships do not necessarily present a laboratory with a risk to impartiality. A relationship that threatens the impartiality of the laboratory can be based on ownership, governance, management, personnel, shared resources, finances, contracts, marketing (including branding), and payment of a sales commission or other inducement for the referral of new customers, etc.
- 4.1.5 If a risk to impartiality is identified, the laboratory demonstrates to eliminate or minimize the risk.

4.2 Confidentiality

- 4.2.1 The laboratory is responsible, through legally enforceable commitments, for the management of information obtained or created during its activities. If the laboratory intends to place information in the public domain, it must inform the customer in advance. Unless agreed between the laboratory and customer or the customer makes the information publicly available, all other information is to be regarded proprietary and confidential.
- 4.2.2 When the laboratory is required by law or authorised by contractual arrangements to release otherwise confidential information, the customer or individual is to be notified (unless the notification is prohibited by law).
- 4.2.3 Information about the customer, obtained from other sources, is to be regarded as confidential. The source is to remain confidential to the customer unless otherwise agreed to by the source.
- 4.2.4 Personnel must keep confidential all information obtained or created during the performance of laboratory activities, except as required by law.

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5.0 STRUCTURAL REQUIREMENTS

5.1.1 legal identity: The Institute IPIRTI is a society registered under the Karnataka Societies Registration Act, 1960. It incorporated on Document: IPIRTI/REGISTRATION. CENTEC is under the umbrella of IPIRTI. The organization structure of IPIRTI and structure of CENTEC are shown in Annexure 3.

5.1.2 The laboratory had defined and documented the range of activities for conformity to the Standard. The range of activities does not include externally provided laboratory activities on an ongoing basis.

a) The responsibility/ authority and the inter relationship of all personnel performing the work affecting the quality of testing has been referenced in job responsibility chart (CENTEC/JRC).



b) HOD/Technical Manager providing supervision to laboratory staff and are vigilant to ensure that all laboratory tests are conducted strictly in accordance with printed standards. Strict supervision at all level is maintained. Should the integrity of any of the staff be in question he would be removed from all duties immediately and investigation would be carried out and necessary corrective action be implemented as necessary.

c) Responsibility and Authority: In Annexure 3 are illustrated the organizational structure of IPIRTI and CENTEC respectively.

The Director, IPIRTI is also the overall head of all the technical and administrative functions of the CENTEC. He is responsible for defining, implementing and reviewing Quality Policy and quality objectives for the laboratory and for providing resources required for proper functioning of the laboratory.

Director, IPIRTI is assisted by Joint Director in the technical and administration of IPIRTI in general and CENTEC in particular. All the test reports are issued under the authority of Joint Director. The feed back information including complaints from customers are reviewed by Joint Director for redressal, corrective action and improvements. The sample cell in charge, reports directly to Joint Director. The functions of sample cell, which is the customer contact point is under the control of Joint Director.

HOD/Technical Manager has an overall responsibility of technical operation of the Laboratory. He controls/supervises on the operators under his authority. He provides necessary resources to ensure the required quality in the test results.

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Head of Laboratory and Technical Manager

The Head of laboratory reports to the Director in the respective areas. The senior most personnel working in the Chemical laboratory and second senior most personnel working in the Mechanical laboratory acts as Technical Manager of Chemical and Mechanical testing disciplines respectively. The next senior most persons of Chemical and Mechanical testing disciplines acts as deputy to Technical Manager and performs the duties of the technical manager in his/ her absence.

The responsibilities of the Head of Laboratory and the Technical Manager are as follows:



- Planning, scheduling Tests for jobs received.
- Monitoring of progress of testing activity,
- Planning, purchasing of equipment and maintaining laboratory Equipment,
- Identifying the training needs with the QMR,
- Initiate actions when departures are observed from the management system or test and or calibration methods. This is with a view to minimizing the recurrence of non conformances,
- Co-ordination in procurement of Capital Equipment.

Specific authority of the Technical Manager

- Approval of documents like operational procedures, related Databases and other documents.
- Approval of Test and or calibration reports.
- Conclusion/s on test results.

d) The senior most scientist in Mechanical Laboratory is appointed, through an executive order, as the Quality Manager who, irrespective of other duties and responsibilities, has the authority for ensuring that the management system related to quality is implemented and followed at all times. The QMR has direct access to the top management at which decisions are made on laboratory policy and resources.

The Quality Manager reports to the Director, IPIRTI and CENTEC, the highest levels of management at which decisions are made on laboratory policies or resources. The Quality Manager oversees all the quality system related functions of the laboratory as per ISO 17025:2017. The responsibilities/authorities assigned to the key officials in the laboratory are indicated in the subsequent paragraphs. Additional duties are assigned through office orders, from time to time. The Heads of Departments have basically the same responsibilities as the Head/Technical Manager in the respective areas.

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Quality Manager's responsibilities are given below:

- To ensure that the Management System related to quality is implemented and followed at all times,
- Identifying the training needs with the TM /HOD/QMR and organize training and maintain necessary records,
- Maintaining liaison with Accreditation bodies (NABL),
- To plan and organize internal quality audit,
- Monitoring effectiveness of the Quality Management system and identify areas of improvements.
- Maintenance of quality system documents.
- Co-ordination of proficiency testing.

e) Deputy Assignment: Quality Manager/ Dy. Quality Manager



The laboratory has also appointed a Deputy quality Manager, who reports to the Quality Manager and also functions as Quality manager in his absence.

- Reviewing/issuing quality system documents after obtaining necessary approvals.
- Organizing Internal Quality Audits and Management Review meetings.

Deputy to technical manager and chemical and mechanical section has been assigned the role and responsibility of Dy. Technical Manager:

- Selecting and carrying out tests as per the prescribed method
- Validation of test method, if required
- Calibration of test equipment
- Calculation of Measurement uncertainty
- Maintenance of equipments
- Entering the information in formats
- Logging, Maintaining history cards of equipment, and
- Preparation of draft test report

f) The personnel and the technical staff are aware of relevance of their duties and contribute to achievement of objectives of the management system by following appropriate test methods and procedures. The laboratory has established and maintained a QMS appropriate to the type, range and volume of activities. Officers/Staff undergo regular Technical/Management training to update the knowledge to achieve the objectives of the management system. The elements of this system have been documented in this document and further elaborated in supporting document and are available to the personnel as required for implementing the QMS.

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- 5.4 Management of CENTEC is committed to carry out testing activities as per ISO/IEC 17025 and relevant NABL specific criteria, satisfying the needs of the customers, the relevant regulatory authorities and accreditation bodies.
- 5.6 Laboratory personnel to have the authority and resources needed to carry out :
 a) implementation, maintenance and improvement of the management system;
 b) identification of deviations from the management system or procedures for laboratory activities;
 c) actions to minimize deviations;
 d) reporting on the management system;
 e) ensuring the effectiveness of laboratory activities.
- 5.7 Laboratory management ensures:
 a) communication on the effectiveness of the management system and customer requirements;
 b) management system integrity.

5.2 FIELD OF ACTIVITY



CENTEC has the following sections in its permanent location

- (i) Mechanical Testing
- (ii) Chemical Testing
- (iii) Carpenter Workshop

The testing facilities available in the CENTEC are given below. Scope of testing of CENTEC labs are given in Document: IPIRTI/CENTEC/SCOPE. List of major equipments available in the CENTEC Labs are given in the Document: IPIRTI/CENTEC/EQUIPMENT LIST.

- (i) Mechanical Testing: Testing wood products.
- (ii) Chemical Testing: Testing of Resin and estimation of preservative chemicals.
- (iii) Carpentry Workshop: preparation of test specimens

5.2.1 SENIOR MANAGEMENT PERSONNEL: The responsibility of quality assurance for tests undertaken by CENTEC labs rests with Quality Manager. The senior scientist of the organization authorized by the Director act as the Quality Manager. The duties and responsibilities of Quality Manager are described under section of job description. Man power and other resources for Quality assurance and verification are under the control of Quality Manager. Quality Manager interacts directly with CENTEC Labs for day to day implementation of Quality Assurance Provisions.

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HOD are the Technical Manager has on overall responsibilities of technical operation of the respective laboratories. He controls/supervises on the test operation under his authority. The duties and responsibilities of Technical Manager are described under section of job description.

HOD/Technical Manager interacts with the Quality Manager for day to day implementation of Quality Assurance Activities.

5.2.2 a) Documents of Employee Responsibilities

CENTEC has adequate management and technical personnel with authority and resources needed to discharge their duties, which include implementation and maintenance and improvement of the management system and to initiate actions to minimize departure from management system and the laid down procedures for performing tests.

b) Minimizing improper influence

The Laboratory Management policies are designed to minimize improper influence which might adversely affect the judgment and integrity of staff and quality of their work. Laboratory and Laboratory Personnel have total independence with respect to technical judgment and test results.



Persons familiar with methods and procedures and purpose of each test, and assessment requirements of test results provide adequate supervision of testing staff. The trainees initially work with trained staff before carrying out independent assignments.

c) Proprietary rights and confidential information

The samples are allotted unique Code Number, Information like name of suppliers are kept confidential to the Laboratory Staff. The Laboratory maintains strict professional secrecy of and information gained in the course of carrying out tests. Official Secret act for defense is read by all Laboratory staff and they sign having read. The proprietary rights are protected. Under no circumstances the results of tests are known to any third party without the written authorization of the customer concerned. No test reports are sent by fax without the customer's prior written permission and communication.

d) Quality policy is maintained and no deviation from such Quality Policy is accepted or permitted whatever influence might be brought to bear on personnel of the Laboratory. Where such influence become apparent this invariably reported to the Quality Manager.

e) CENTEC is independent and free from any commercial or other pressures, which might influence quality of work of its personnel. Further, it does not involve in any activities nor intends to do in future which diminish confidence in its competence, impartiality, judgment or operational integrity.

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6.0 RESOURCE REQUIREMENTS

6.1 General

The laboratory have available the necessary resources to perform its laboratory activities.

6.2 Personnel

All personnel are to act impartially, be competent and adhere to the laboratory's management system.

6.2.1 The laboratory is having required manpower with necessary qualifications, experience and skills to perform different functions.



6.2.2 The competence requirements for each function influencing the results of laboratory activities are documented

- a) The HOD of respective laboratory provides training to personnel based on needs considering change in technology, customer requirements and other continuous changes to meet the technical competence.
- b) Authorized persons carry out specialized operations within the laboratory, which are sensitive.
- c) Qualifying is based on the skills, training or experience for testing.

6.2.3 Laboratory insures that the personnel are competent to perform the activities for which they are responsible and to evaluate the significance of deviations.

- a) Fresh recruits, if used to carry out the test jobs are supervised to ensure that quality of work is maintained. Similar supervision is exercised when personnel under contract are employed.
- b) Records of relevant competence, educational and professional qualification, training and experience are maintained by the AO.
- c) The effectiveness of training for the personnel undergone training is evaluated by Quality Manager/ Joint Director.

6.2.4 Duties, responsibilities and authorities are communicated to personnel. The current job description of managerial, technical and key support personnel involved in testing is maintained (see CENTEC/ JRC)

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6.2.5 The management authorizes specific personnel to perform particular type of test to issue test reports, and records are maintained for relevant authorization as mentioned in Job responsibility chart (see CENTEC/ JRC).

Procedures and records are maintained for personnel covering: determination of competence requirements; selection, training, supervision and authorization; and monitoring of competence.

6.2.6 Personnel are authorized to perform specific activities including:

- a) develop, modify, verify and validate methods;
- b) analysis of results, statements of conformity and opinions / interpretations;
- c) report, review and authorize results

Reference: Procedure for personnel IPIRTI/QP 11.

6.3 Facilities and environmental conditions

6.3.1 Laboratory has created necessary environmental conditions for carrying out tests as per the requirements of the specifications.

6.3.2 The environmental conditions are monitored and controlled as required by the specifications/test procedures and recorded. Testing activity is stopped when the environmental conditions are likely to jeopardize the results.

6.3.3 Effective separation is provided between areas carrying out incompatible activities.



6.3.4 Entry to testing areas is controlled.

6.3.5 Measures have been taken to maintain good house keeping in the laboratory and safety measures for personnel and equipment as required.

6.4 Equipment

The laboratory is having suitable equipment and instruments to perform all functions within the scope of services. The equipments and instruments are maintained as per the instructions in respective operation manuals and calibrated periodically as mentioned in the document IPIRTI/CENTEC/EQUIPMENT LIST. A list of test equipment available in laboratory is given in IPIRTI/CENTEC/EQUIPMENT LIST.

6.4.1 Authorized persons have access to equipment required for the correct performance of the laboratory activities and which can influence the results. It is ensured that competent and

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authorized personnel operate specific and sophisticated equipment. Wherever a procedure is defined to be such, the list of authorized personnel is detailed in the corresponding procedures (see CENTEC/JRC).

6.4.1.2 Operation/instruction/maintenance manuals of equipment are maintained up to date and be made available for use by laboratory personnel (see CENTEC/JRC). Equipment outside the permanent control of the laboratory if any are ensured to be capable of satisfying the requirements in the standard.

6.4.1.3 Each equipment is uniquely identified. It is ensured that the equipment meets specification & accuracy requirements and is having valid calibration (see IPIRTI/CENTEC/EQUIPMENT LIST).

6.4.1.4 Records pertaining to all equipment are identified and maintained in respective Equipment registers (see CENTEC/ NABL/MLR) and it contains:-



- Name of the equipment,
- Manufacturer name, model, Serial No.
- The current location, placement and installation.
- Date received and date placed in service
- Manufacturer’s operating instructions
- Status of calibration
- Details of maintenance and repair
- Details of usage

6.4.1.5 Details of usage need not be recorded for that equipment like PC, printers, plotters, stabilizers, isolation transformers, etc.

Instruments used for test and measurements are calibrated with valid traceability. Such instruments, which do not need calibration but used in test/calibration processes, is checked for performance (See IPIRTI/QP 13)

6.4.1.6 All equipment are maintained in order to ensure that it meets the required specifications.

It is ensured that the equipment is not subjected to mishandling, overloading, rough use, dropping, transport or storage by wrong means. In case of mishandling, the equipment is checked for its normal operation followed by a calibration. Equipment found defective and not useful for the intended purpose is clearly identified by marking “Not in use”/ “under repair” and separated from place of use. The laboratory examine the effect of defect or departure from specified limits as per ‘control of non-conforming testing’ (IPIRTI/ QP 05). Equipment after necessary repairs is re-calibrated or checked for accuracy with reference standard before use. When equipment is identified as defective, the effect of this defect on previous tests or calibrations is investigated and if necessary the procedure regarding control of non-conforming work is followed. Records pertaining to usage of each equipment are maintained.

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- 6.4.1.7 All equipments in the laboratory requiring calibration are labeled, coded and identified to indicate the status of calibration, including the date when last calibrated, the date of expiration criteria and when re-calibration is due. HOD/Technical Manager/ Scientist is designated to maintain the data pertaining to equipment calibration under the authority of Quality Manager.
- 6.4.1.8 Intermediate checks where ever necessary are done as per Intermediate check procedures (CENTEC/NABL/ICPs) at regular intervals (see IPIRTI/CENTEC/EQUIPMENT LIST).
- 6.4.1.9 When calibration give rise to a correction factor, the laboratory has procedure to ensure that the correction is taken into computation when the equipment is used and the same is recorded and checked by the Technical manager/ HOD. The use of the correction factor derived from the calibration certificate is checked by Technical Manager/ HOD.
- 6.4.1.10 The equipments are safeguarded by means of seals/ Stickers by the calibration agencies to prevent adjustments which would invalidate the test and evaluation results.
- 6.4.1.11 Preventive maintenance is carried out to avoid possible breakdowns, wear and tear.
- 6.4.1.12 Suitable procedures/work instructions including checklists for identified equipment, schedule and actual date of maintenance is made if required.
- 6.4.1.13

When an equipment goes for outside calibration, the HOD/Technical Manager ensures that the function and calibration status of the equipment are checked and shown to be satisfactory before the equipment is taken into service.



Reference

- *Instruction/Operating/Service/Maintenance manuals/Technical literature/ Log book of equipment*
- *Procedure for control of non-conforming testing IPIRTI/ QP 05*
- *Procedure for Safe handling, transport & maintenance of equipment IPIRTI/QP 13.*

6.4.2 Equipment outside the permanent control of the laboratory if any, are ensured to be capable of satisfying the requirements in the standard.

6.4.3 A procedure for the proper handling, transport, storage, use and planned maintenance to ensure proper functioning of equipment and to prevent contamination is maintained. All customer items received for test or any other are identified uniquely with Job cards, throughout the service. In case of multiple items, suffix numbers are used.



6.4.3.1 Identification is maintained during grouping of samples, transfer of items within and from the laboratory.

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- 6.4.3.2 Documented procedures are maintained in regard to receipt, handling, retention and disposal of items.
- 6.4.3.3 Abnormalities, departures from the normal/specified conditions, suitability of an item for test, an item does not cover the description provided, or insufficient details at further stages after acceptance are recorded and made known to customer at the earliest.
- 6.4.3.4 The lab has procedure and adequate facilities to avoid any damage or deterioration to the test items during storage, handling, transport & preparation of items, any special instructions supplied by the customer is followed.
- 6.4.3.5 The materials are stored in ambient condition.
- 6.4.3.6 While storing, measures are taken to identify the status, especially in regard to incoming and outgoing, of the items distinctly. Safety of the items is also ensured.

Reference: Procedure for handling of test items IPIRTI/QP 16

- 6.4.4 Before being placed in or returned to service, the laboratory shall verify that equipment complies with specified requirements
- 6.4.5 Equipment are capable of achieving the measurement accuracy or measurement uncertainty (MU) required to provide a valid result.
- 6.4.6 Measuring equipment are calibrated when the measurement accuracy or measurement uncertainty affect the validity of results or if metrological traceability of the reported result is required.
- 6.4.7 A calibration program is established, reviewed and adjusted as necessary, to ensure confidence in the status of calibrations.
 1. All equipment such as test and measuring instruments, reference standard systems etc., used for measurement purposes and have bearing on accuracy and validity on test results are calibrated or checked for performance before putting into service.
 2. The laboratory has established and operates a program schedule to ensure calibration and verification of equipment including reference materials used with traceability to National/International Standards.
 3. Calibration certificates are maintained.
 4. Wherever automated test techniques are used, the validity and security of software is ensured. During such checks, performance is measured to ensure the operations are within the specifications & also traceability.
 5. The laboratory has a program and procedure for calibration of its reference standards as given in document no. IPIRTI/ CENTEC/ EQUIPMENT LIST.

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6. The reference material, where ever possible shall be traceable to SI unit of measurement. Internal reference material is checked technically before their use in tests.
7. Laboratory has a time schedule, programme or calibration schedule for all equipments to ensure periodic calibration, intermediate checks and verification. The intermediate checks of reference materials/ equipments/ instruments are carried out according to corresponding intermediate check procedures (see CENTEC/NABL/ICP) as per the schedule mentioned in document no. IPIRTI/ CENTEC/ EQUIPMENT LIST.
8. In case of newly received equipment, the calibration status and report as supplied by the manufacturer are accepted.
9. Each equipment is identified for its calibration status.
10. External calibration is carried out from NABL accredited laboratories only.

Reference: Procedure for metrological Traceability IPIRTI/QP 14

6.4.8 All equipment which requires calibration or has a defined period of validity are labelled or otherwise identified.

6.4.9 Overloaded, mishandled or poorly functioning equipment are taken out of service, isolated and not reused until verified that it performs correctly. The effect of such defective equipment are investigated and the management of nonconforming work initiated.



6.4.10 A procedure is followed when intermediate equipment checks are necessary.

6.4.11 When calibration or reference material data includes reference values or correction factors, it is ensured the reference values or correction factors are updated and implemented as appropriate to meet specified requirements

6.4.12 Practical measures are taken to prevent unintended adjustments to equipment. The equipments are safeguarded by means of seals/ Stickers by the calibration agencies to prevent adjustments which would invalidate the test and evaluation results.

6.4.13 Records pertaining to all equipment are identified and maintained in respective Equipment registers (see CENTEC/ NABL/MLR) and Records need to be retained for equipment which can influence laboratory activities, including, it contains:-

- o identity;

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- manufacturer's name, type and serial number;
- evidence of verification;
- location;
- calibration dates, results, adjustments, acceptance criteria, next calibration due date or interval;
- reference material documentation, results, acceptance criteria, relevant dates and period of validity
- maintenance plan and maintenance performed;
- details of damage, malfunction, modifications or repair

6.5 Metrological traceability



6.5.1 Laboratory maintains metrological traceability of its measurement results by a documented unbroken chain of calibrations, each contributing to the measurement uncertainty, linking them to an appropriate reference.

6.5.2 Measurement results are traceable to SI units through either:

- a) calibration by a competent laboratory;
- b) certified values of certified reference materials from a competent producer with stated traceability to SI units;
- c) direct realization of the SI units.

b) All equipment such as test and measuring instruments, reference standard systems etc., used for measurement purposes and have bearing on accuracy and validity on test results are calibrated or checked for performance before putting into service.

- c) The laboratory has established and operates a program schedule to ensure calibration and verification of equipment including reference materials used with traceability to National/International Standards.
- d) Calibration certificates are maintained.
- e) Wherever automated test techniques are used, the validity and security of software is ensured. During such checks, performance is measured to ensure the operations are within the specifications & also traceability.
- f) The laboratory has a program and procedure for calibration of its reference standards as given in document no. IPIRTI/ CENTEC/ EQUIPMENT LIST.
- g) The reference material, where ever possible shall be traceable to SI unit of measurement. Internal reference material is checked technically before their use in tests.

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- h) Laboratory has a time schedule, programme or calibration schedule for all equipments to ensure periodic calibration, intermediate checks and verification. The intermediate checks of reference materials/ equipments/ instruments are carried out according to corresponding intermediate check procedures (see CENTEC/NABL/ICP) as per the schedule mentioned in document no. IPIRTI/ CENTEC/ EQUIPMENT LIST.
- i) In case of newly received equipment, the calibration status and report as supplied by the manufacturer are accepted.
- j) Each equipment is identified for its calibration status.
- k) External calibration is carried out from NABL accredited laboratories only.

Reference: Procedure for metrological Traceability IPIRTI/QP 14

6.6 Externally provided products and services

6.6.1 Sub-contracting of tests are not done. This clause is, therefore, not applicable and hence not documented.



Only suitable externally provided products and services that affect laboratory activities are to be used when such products or services are: a) incorporated into the laboratory's own activities; b) provided directly to the customer by the laboratory as received from the external provider; c) used to support the operation of the laboratory.

It is the policy of CENTEC to use only those outside support services that are of adequate quality to sustain confidence in laboratory's testing activities.

6.6.2 A procedure and records are available for:

- a) defining, reviewing and approving externally provided products and services;
- b) the criteria for evaluation, selection, monitoring and re-evaluation of external providers;
- c) ensuring, prior to use or supply to customer, externally provided products and services conform to the laboratory's established requirements or the Standard;
- d) actions arising from evaluations, monitoring or re-evaluations of external providers.

Quality of Capital Equipment and Consumables CENTEC ensures purchase of capital equipment and consumables like chemicals, glassware, jigs and fixtures against the stipulated specification and also ensures to have necessary checks or other actions on purchased goods before use. The records of action taken to check compliance are maintained.

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6.6.2.1 Capital equipments are purchased and accepted as per procedure given in Doc: IPIRTI/QP/03. Such equipments are inspected, installed and calibrated prior to use.

6.6.2.1 Quality of outside support services



6.6.2.2 Service/maintenance contract of equipment are arranged as per Doc: IPIRTI/QP 03.

6.6.2.3 For use of External Calibration Services, CENTEC ensures to utilize the services of only NABL accredited laboratories.

6.6.2.1 Procedure for purchasing and commissioning of new equipment is given in IPIRTI/QP 03.

6.7 *Reference:* Externally provided products and services *IPIRTI/QP 03*

6.6.3 Communication to external providers is required for: a) the products and services to be provided; b) acceptance criteria; c) competence of personnel; d) activities to be performed by the laboratory or laboratory customers at the external provider's premises.

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7.0 PROCESS REQUIREMENTS

7.1 Review of requests, tenders and contracts

7.1.1 A procedure is established for the review of requests, tenders and contracts, ensuring: a) the requirements are defined, documented and understood; b) the laboratory has the capability and resources to meet the requirements; c) the customer being informed of the activities to be performed by external providers and approval from the customer obtained; d) appropriate methods or procedures are selected which customer needs. Jobs are taken up at CENTEC permanent site at Bangalore through a request made by customers.

The Sample Cell in charge is the nodal interface between the customer and the laboratory.

The Sample Cell in charge, registers the requests (for testing) after a review for the capabilities of the laboratory. If the items/technical data received through correspondence, then the Sample Cell in charge registers the job for the customer. The samples along with the job cards are send to respective laboratory for execution.

Each new request before registration and acceptance is reviewed for



- a) Capacity of the laboratory to meet the requirements of the customer.
- b) The capacity include availability of resources like testing equipment together with the infrastructure, consumables, personnel with skills and expertise to carry out the tests and verification, information resources like test methods, specifications, procedures and technology.
- c) Adequate identification of the test items like nomenclature, identification mark/code, make, serial no etc.,
- d) Sample adequacy for desired tests.
- e) Payment and other commercial aspects.

CENTEC does not outsource any testing activity.

Any differences, deviations from originally required or accepted contract, are resolved before taking up the job, and the changes communicated to the customer. It is ensured that each contract is acceptable to the customer and the laboratory. If a contract needs to be amended after the work has commenced, the same contract review process is repeated and any amendment is communicated to the affected personnel.

The contracts are written or oral.

Reference: Procedure for review of requests, tenders and contracts IPIRTI/QP 02

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7.1.2 The laboratory informs the customer when the method requested is not considered appropriate or out of date

7.1.3 The standard or specification and the decision rule are clearly defined when the customer requests a statement of conformity to a specification or standard for a test. The decision rule is communicated to and agreed with the customer, unless inherent in the requested specification of standard.

7.1.4 Before laboratory activities commence, any differences between the request or tender and the contract must to be resolved. Deviations requested by the customer shall not impact the integrity of the laboratory or validity of results.

7.1.5 Customer is informed on any deviations to the contract.

7.1.6 Amendments to contract following commencement of work requires the contract review process to be repeated and amendments communicated to all affected personnel.

7.1.7 The laboratory shall cooperate with customers to clarify request and to allow the customer to monitor the laboratory's performance.

7.1.8 Records of contract reviews and significant changes must be kept. Records include pertinent discussions relating to the customer's requirements or results generated.

7.2 Selection, verification and validation of methods



- a) Test methods published by BIS or other national/international standards are used for testing. The laboratory uses the latest valid edition of the standard.
- b) For sampling, the laboratory uses the procedure as specified in the applicable standard.

7.2.1 Selection and verification of methods

7.2.1.1 Appropriate methods and procedures are used for laboratory activities. This includes for the evaluation of measurement uncertainty and statistical techniques for analysis of data.

7.2.1.2 All methods, procedures and supporting documentation shall be kept current and readily available to personnel.

7.2.1.3 The laboratory ensures the use of latest standard.

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Laboratory developed methods

a) Laboratory developed method is not used for testing unless included in the relevant Indian standards.

Non- Standard methods (Methods not covered by the Standard /Specifications)

a) Non-standard methods are not used.

7.2.2 Validation of methods:

7.2.2.1 Non standard methods as and when required will be validated before use.

7.2.2.2 When changes are made to validated methods, the influence of such changes are determined and validation performed again, if appropriate.

7.2.2.3 The performance characteristics of validated methods are consistent with specified requirements and relevant to the customers' needs.

7.2.2.4 Validation records must include the following:



- a) the validation procedure used;
- b) specification of the requirements;
- c) performance characteristics of the method;
- d) results obtained;
- e) a statement on the validity of the method for its intended use.

7.3 Sampling

Sampling is not in the scope of IPIRTI.

This laboratory provides testing services and is responsible for quality of result performed in the test items only which are selected and sent by the customers.

The test specimens are prepared from the test items supplied by the customers in accordance with relevant test standards.

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7.4 Handling of test or calibration items

7.4.1 The laboratory have procedure for the transportation, receipt, handling, protection, storage, retention and disposal or return of test or calibration items. This includes provisions to protect the item, the interests of the laboratory and the customer.

All customer items received for test or any other are identified uniquely with Job cards, throughout the service. In case of multiple items, suffix numbers are used.



7.4.2 Identification is maintained during grouping of samples, transfer of items within and from the laboratory.

- Documented procedures are maintained in regard to receipt, handling, retention and disposal of items.
- Abnormalities, departures from the normal/specified conditions, suitability of an item for test, an item does not cover the description provided, or insufficient details at further stages after acceptance are recorded and made known to customer at the earliest.
- The lab has procedure and adequate facilities to avoid any damage or deterioration to the test items during storage, handling, transport & preparation of items, any special instructions supplied by the customer is followed.
- The materials are stored in ambient condition.
- While storing, measures are taken to identify the status, especially in regard to incoming and outgoing, of the items distinctly. Safety of the items is also ensured.

7.4.3 Upon receipt of the item, abnormalities or deviations from specified conditions must be recorded. If there is doubt as to the suitability of the item or when the item does not conform to the description provided, the customer must be consulted before proceeding and record the results of the consultation. Following, if the item is to proceed to testing or calibration, the laboratory must include a disclaimer in the report indicating that results may be compromised.

7.4.4 When items need to be stored or conditioned, the conditions shall be maintained, monitored and recorded.

Reference: Procedure for handling of test items IPIRTI/QP 16

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7.5 Technical records

7.5.1 Technical records for each laboratory activity includes: results; report; sufficient information to enable repetition under conditions as close as possible to the original; identification of factors affecting the result and MU; date of activity; identity of personnel responsible for each activity and for checking data and results. Original observations, data and calculations are to be recorded at the time they are made and be identifiable to the specific task.

Records of original observations, derived data and sufficient information to establish an audit trail, calibration records staff records and a copy of test report issued is retained for specific periods (see IPIRTI/QP 08). The records of each test is have sufficient information so as to facilitate identification of factors affecting uncertainty and to enable the test is repeated under the conditions as close to the original to the extent possible. The records include the identity of the personnel responsible for testing and relevant checking activity.

Observations data and calculations are recorded at the time they are made and identified to the specific test job.

When mistakes occur in records, each mistake is crossed out (not erased, made illegible or deleted) and the correct value entered alongside. All such alterations to the records are signed and authenticated by the person making the correction.



7.5.2 Amendments to technical records are traceable to previous versions or to original observations. Original and amended data or files are kept, including date of alteration, an indication of the altered aspects and the identity of the personnel responsible.

7.6 Evaluation of measurement uncertainty

7.6.1 The contributions to measurement uncertainty (MU) must be identified. All contributions which are of significance, including those arising from sampling, are to be taken into account using appropriate methods of analysis.

7.6.2 Measurement uncertainty is estimated for all testing activities. The measurement uncertainty is estimated as per IPIRTI/QP 19.

7.6.3 In cases where rigorous evaluation of the MU may be precluded, due to the nature of the test method, an estimation is made based on an understanding of the theoretical principles or practical experience of the performance of the methods.

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7.7 Assuring the validity of results

7.7.1 The laboratory have procedure for monitoring the validity of results. The data is to be recorded in such a way as to allow trend analysis and where practical, statistical techniques are to be applied to review the results. For assuring the quality of test the laboratory has quality control procedures adopted from publishing standard specification methods for monitoring the validity of tests undertaken, if any. The resulting data are recorded in such a way that trends are detectable. Quality control activities are carried out in the laboratory in addition to the internal quality audits to ensure quality of work and results.

- a) use of reference materials or quality control materials;
- b) Samples are taken from any stage in the process within the laboratory, including completed activities/issued reports;
- c) functional checks of measuring and testing equipment;
- d) use of check or working standards with control charts;
- e) intermediate checks on measuring equipment;
- f) replicate tests;
- g) retesting of retained items;
- h) correlation of results for different characteristics of an item;
- i) review of reported results;
- j) intra-laboratory comparisons;
- k) testing of blind sample(s).



Any deviation detected during quality control checks dealt in line with control of non-conforming work. A quality control report is initiated for necessary corrective and preventive action requests.

Such control reports is reported to the Director. Analysis of quality control activities is put up

7.7.2 The laboratory monitors its performance by comparison with results of other laboratories, where possible and appropriate. This monitoring are planned and reviewed and include, participation in inter laboratory comparisons.

Reference:

Procedure for Quality assurance activity IPIRTI/QP 17

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7.8 Reporting of results

7.8.1 Reports of test carried out by the laboratory are issued to customer in the form of test report uniquely identified. Results of the report are unambiguous, complete, accurate, clear and contains all activities performed in full, and is not partial. Results are reviewed and authorised prior to release.

The results are provided accurately, clearly, unambiguously and objectively. This is usually in the form of a report. In addition to the results, all information agreed with the customer and necessary for the interpretation of the results and required by the method are also provided.



The results can be reported in simplified manner when agreed with the customer. Any information in 7.8.2 to 7.8.7 not reported to the customer are made available.

7.8.2 Common requirements for test reports

All issued reports must be maintained as technical records.

The test report contains:

- Title of the report.
- Name, address of the laboratory.
- location of the performed activities;
- unique identification that all its components are recognised as a portion of a complete report and a clear identification of the end;
- e) name and contact information of the customer;
- f) method used;
- g) a description, unambiguous identification, and if necessary, the condition of the item;
- h) date of receipt or date of sampling of the item where this is critical to the validity and application of the results;
- i) date(s) of the performance of the laboratory activity;
- j) date of issue of the report;
- k) reference to the sampling plan and sampling method used if relevant to the validity and application of the results;
- l) statement to the effect that the results only relate to the item tested, calibrated or sampled;
- m) the results with the units of measurement, where appropriate;
- n) additions, deviations or exclusions from the method;
- o) identification of the person authorizing the report;
- p) clear identification when the results are from external providers..

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Additionally, test reports may contain based on necessity:

- Characterization and condition of test item, if required
- Identification of standards used
- Deviations, additions or exclusions, from the test method
- Statement of compliance/ non-compliance with requirements and/or specifications

Reports are designed to ensure the above requirements with good presentation for easy understanding and assimilation. Report formats are standardized.

Reports do not contain any professional judgment. No opinions and interpretations are included in the report. A statement of conformity or non-conformity of the results with requirements as per relevant standards is mentioned in the report.

- A hard copy of the test report meeting the requirements stated above is issued.
- When a test report after issue is to be amended wholly or partially, the amendment document have suitable identification besides including a statement that it is supplement such as “Amendment to Test Report No.....” The amendment document also includes other details of identification.
- In case of fully amended fresh report, the new report is issued with unique identification and contain a statement that it supercedes the earlier issued report.
- In case of loss of reports, duplicate copy marked “Duplicate Test report” is issued on request.

Electronic transmission of test reports are not done. This clause is, therefore, not applicable and hence not documented.



The test report formats are designed to accommodate each type of test carried out and to minimize the possibility of misunderstanding and misuse.

7.8.8.2 The laboratory is responsible for all the information in the report, except that provided by the customer. Data provided by the customer is to be clearly identified. Additionally, a disclaimer must be included when information is supplied by the customer which can affect the validity of the results. When the laboratory is not responsible for sampling, e.g. the sample has been supplied by the customer, it must state in the report that the results apply to the sample as received.

Reference: Test report formats.

7.8.3 Specific requirements for test reports

Where required for the interpretation of test results, reports also include:

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- a) information on specific test conditions, e.g. environmental conditions;
- b) a statement of conformity with requirements or specifications, where relevant;
- c) where applicable, MU in the same units as the measure and or in a term relative to the measure and;
- d) opinions and interpretations, where appropriate; e) information which may be required by specific methods, authorities, customers or groups of customers.

Control of Data

5.4.7.1 Calculations and data transfers are subjected to appropriate checks in a systematic manner. Test data are recorded by the Scientist and checked by the HOD/ Technical manager arithmetic calculations are verified.

5.4.7.2 Software used in computer processing bear security of password to avoid unwanted alteration.

Reference: Procedure for Estimation of uncertainty of measurement IPIRTI/QP 19

Reference: Procedure for carrying out tests as per relevant Indian standards.

7.8.4 Specific requirements for calibration certificates

this clause is not applicable

7.8.5 Reporting sampling - specific requirements

this clause is not applicable

7.8.6 Reporting statements of conformity



7.8.6.1 When a statement of conformity to a specification or standard is provided, the laboratory documents the decision rule it employs, taking into account the level of risk associated with the decision rule, and apply the decision rule.

7.8.6.2 The laboratory must report on the statement of conformity:

- a) the results to which the statement of conformity applies;
- b) which specifications, standards or parts thereof that are met or not met;
- c) the decision rule applied (unless inherent in the requested specification or standard).

7.8.7 Reporting opinions and interpretations

7.8.7.1 When opinions and interpretations are provided, it must be ensured that only authorised personnel release the respective statement. The basis upon which the opinions or interpretations have been must be documented.

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7.8.7.2 Opinions and interpretations included in reports are based on the results obtained from the tested item and be clearly identified as such

7.8.7.3 When opinions and interpretations are verbally communicated to the customer, a record of the dialogue are kept.

7.8.8 Amendments to reports

7.8.8.1 When an issued report requires changing, amendment, or reissuing, any change of information is clearly identified. Where appropriate, the reason for the change is included in the report.

7.8.8.2 The material amendment to the test reports, when ever required after issue are made only in the form of further document, which includes the statement:-

supplement to test report, test report number and sample code number for identification of the test report earlier test report issued'. Such amendment meet all the requirements as per ISO 17025: 2017.

7.8.8.3 Whenever it is necessary to issue a complete new test report, this fact is uniquely identified and contains a reference to the original test certificate that it replaces.

7.9 Complaints

The laboratory have a documented process for receiving, evaluating and making decisions on complaints.

The complaints are received by the Joint Director/ sample cell and forwarded to the respective department for necessary action.



- JD with the help of respective department carries out detailed analysis of the complaints received and takes appropriate corrective/preventive actions.

- Actions taken are communicated to the customer where required.

Procedure for handling complaints is given in IPIRTI/QP 04

The laboratory is maintaining complaint register.

7.9.2 A description of the complaint handling process is made available to any interested party on request. Upon receiving a complaint, the laboratory determines if it relates to the laboratory activities it is responsible for and if so, needs to deal with the complaint. The laboratory is responsible for all decisions in handling the complaint.

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7.9.3 The complaints handling process include:

- a) a description of the process for receiving, validating, investigating the complaint, and deciding what actions are to be taken in response to it;
- b) tracking and recording complaints, including actions taken to resolve them;
- c) ensuring that any appropriate action is taken.

7.9.4 The laboratory receiving the complaint is responsible for gathering and verifying all information to validate the complaint.

7.9.5 Whenever possible, the laboratory acknowledge receipt of the complaint and provide the complainant progress reports and the outcome.

7.9.6 The outcomes are communicated to the complainant by, or reviewed and approved by, individual(s) not involved in the original laboratory activities in question.

7.9.7 Whenever possible, the laboratory give formal notice of the end of the complaint handling to the complainant



Reference: Procedure for handling complaints IPIRTI/QP 04

7.10 Non conforming work

Non conforming testing as found during quality checks/quality audits, through customer complaint/feed back, testing aspects like calibration, purchase of supplies and services, test report checking, management reviews, internal audits and during implementation of management system.

7.10.1 The laboratory have a procedure for the addressing laboratory activities or results of these activities that do not conform with its own procedures or agreed customer requirements. In the event of detection of non-conformance work, following actions are initiated:

- a) the responsibilities and authorities for the management of nonconforming work are defined;
- b) actions are based upon the risk levels established by the laboratories;
- c) an evaluation is made of the significance of the nonconforming work, including an analysis of the impact on previous work;
- d) a decision is taken on the acceptability of the nonconforming work;
- e) the customer is notified and work recalled, if necessary;
- f) Resumption of work is authorized only by the Technical Manager/Quality manager.

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7.10.2 Records are retained of nonconforming work and actions as specified in 7.10.1 b) to f)

7.10.3 Where evaluation of nonconforming work identifies the chance for reoccurrence, or doubt is cast over the laboratory's compliance with its management system, the laboratory implements corrective action.

Reference: Procedure for control of non-conforming testing IPIRTI/QP 05.

7.11 Control of data and information management

7.11.1 *The laboratory have access to the data and information needed to perform its activities.*

7.11.2 *The laboratory information management system(s) (LIMS) if used for the collection, processing, recording, reporting, storage or retrieval of data are validated for functionality. This includes the proper functioning of interfaces within the LIMS by the laboratory before introduction. Whenever there are changes, including modifications to commercial off-the shelf software or laboratory software configuration, they need to be authorised, documented and validated before implementation.*



7.11.3 *The LIMS is:*

- a) *be protected from unauthorised access;*
- b) *be safeguarded against tampering and loss;*
- c) *be operated in an environment that complies with supplier or laboratory specifications or, for non-computerised systems, provides conditions which safeguard the accuracy of manual recording and transcription;*
- d) *be maintained in a manner which ensures the integrity of the data and information;*
- e) *include recording system failures and the appropriate immediate and corrective actions.*

7.11.4 If the LIMS is maintained off-site or by an external provider, the laboratory ensures that the provider complies with all applicable requirements of the Standard.

7.11.5 Instructions, manuals and reference data relevant to the LIMS are made readily available to personnel.

7.11.6 Calculations and data transfers are checked.

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8 MANAGEMENT SYSTEM REQUIREMENTS

8.1 General

8.1.1 The laboratory t establish, document, implement and maintain a management system that is capable of supporting and demonstrating the consistent achievement of the requirements of the Standard and assuring the quality of laboratory results. In addition to meeting the requirements of clauses 4 to 7, the management system implemented comply with Option A.

8.1.2 The management system is to address, as a minimum;

- management system documentation (8.2);
- control of management system documents (8.3);
- control of records (8.4);
- actions to address risks and opportunities (see 8.5);
- improvement (8.6)
- corrective actions (8.7);
- internal audits (8.8);
- management reviews (8.9).



8.1.3 Option B

This clause is not applicable

8.2 Management system documentation

8.2.1 Laboratory management establish, document, and maintain policies and objectives for the fulfilment of the Standard. Policies and objectives need to be acknowledged and implemented at all levels of the laboratory organisation.

The laboratory has established and maintained a Management system appropriate to the scope, type, range and volume of activities of CENTEC. The elements of this system have been documented in this manual and further elaborated in supporting documents to the extent necessary to assure the quality of test results. The documents made are available to the personnel concerned for understanding as per Document Distribution log in and implementing the management system, policies and procedures in their work.

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a. Quality Manual

This Quality Manual is the Apex level document defining the features of the quality system installed by the CENTEC, IPIRTI for its testing activities. The system policies, the Quality Policy, the overall quality objectives are defined in this Quality Manual. The overall objectives are reviewed during management reviews. References are made to the procedures and other documents used in the quality system as appropriate.



The Quality Manual is approved by the Director, IPIRTI and issued and controlled by the Quality Manager as per the procedure contained in IPIRTI/QP 01. Any staff member can borrow the Quality Manual from the respective Head of Lab for reference, but the custody and maintenance of the Quality Manual rest with the holder only. The copyholders are responsible to update their copy incorporating the amendments/revisions issued by Quality Manager.

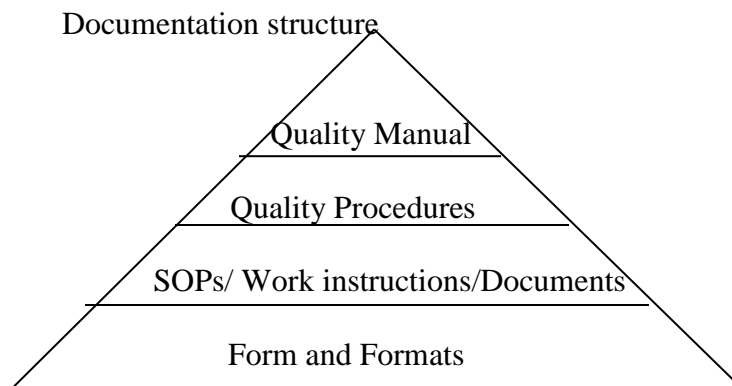
<u>Authorized Holder</u>	<u>Copy No</u>
Master Copy (with the QMR/ Dy. QMR)	01
Director, IPIRTI	02
Joint Director, IPIRTI	03
HOD/TM (Mechanical)	04
HOD/TM (Chemical)	05
Administrative Officer	06
Accreditation officer, NABL, New Delhi	07
Controlled copies are distributed by the Quality Manager.	

- 1) The Quality Policy statement is spelt out on page no. 12 of this Quality Manual. Through this policy, the management commits to comply with ISO/IEC 17025:2017 and to continually improve the effectiveness of the management system. Evidences are provided to this effect. The quality objectives are as given in page 12 of Quality Manual.

The quality policy and the objectives have been communicated throughout the organization stressing the importance of meeting the customer requirements and regulatory requirements where applicable.

- The management through the quality manual and associated documents communicates to all officers/ staff in the CENTEC labs to ensure reliable services to it's customers and simultaneously meeting the requirements if ISO/IEC 17025-2017.

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- The responsibilities of the Technical and quality managers are addressed in clause no 4.1.5 h) to j) of Quality Manual.
- The Top management ensures that the integrity of management system is maintained when changes to the management system are planned and implemented.

8.3 Control of management system documents



8.3.1 The Laboratory has a procedure to maintain control and distribution of documents in the management system.

8.3.2 It is ensured that:

- a) documents are approved prior to issue by authorised personnel;
- b) documents are periodically reviewed and updated;
- c) changes and the current revision status of documents are identified;
- d) relevant versions of documents are available and their distribution is controlled;
- e) documents are uniquely identified;
- f) unintended use of obsolete documents is prevented.

The following are the important features of the control exercised on the documents:

- a) Management system documents suitably identified with unique identification system,
- b) Preparation, review, approval and issue of management system documents by authorized personnel are as detailed below

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Sl. No.	Description of document	Prepared by	Reviewed and Approved by	Issued by
1	Quality Manual	Quality Manager	Director	Quality Manager
2	Quality Procedure	Quality Manager	Director	Quality Manager
3	Test procedures/ work instructions/ SoPs	Technical Manager	Quality Manager /Director	Quality Manager
4	Form and formats	Technical Manager	Quality Manager	Technical Manager

- c) A master list identifying the current revision status and distribution of documents to preclude the use of invalid and/or obsolete documents,
- d) Availability of appropriate documents at all locations where operations essential to the effective functioning of the laboratory are performed,
- g) Review of documents for any changes necessary to ensure continuing suitability and compliance with applicable requirements is done once in a year during Management review.
- h) Ensure that obsolete documents are not used, but are retained with suitable identification for either legal or knowledge preservation purposes.

Document Changes



- a) Changes to documents shall be reviewed and approved by the same authority who has done the original review and approval of the original document
- b) The altered text is identified in the document by underlining the text,
- c) No hand written changes are permitted,
- d) Procedure is established to describe how Changes in documents maintained in computerized system are made and controlled.

Reference: Procedure for document control IPIRTI/QP 01

8.4 Control of records

8.4.1 Legible documents are retained to demonstrate fulfilment of the requirements in the Standard

General:

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- a) Quality records are maintained in the form of files and registers. Identification and indexing are such as to ensure legibility, easy retrievability, prevention of damage and deterioration, security, unauthorized accessibility and confidentiality.
- b) These quality records are identified and controlled as detailed in the procedure IPIRTI/QP 08.

8.4.2 The laboratory implement controls for the identification, storage, protection, back-up, archive, retrieval, retention time, and disposal of its records. Records are to be retained for a period consistent with contractual obligations. Access to these records are to be consistent with confidentiality commitments, with records readily available.

Collection, Storage And Retention

- a) Quality records are collected, filed and stored year-wise corresponding to the financial year, April-March.
- b) Quality Manager/HOD maintains list of quality records and are responsible for ensuring that records are legible and safely retained for a specific period.
- c) The retention period and person responsible for maintenance of quality records is given Q P 08.

Disposition of records

Respective department in charge and QMR are responsible for removal/disposal of obsolete quality records after the retention period. The obsolete records are disposed off by shredding or burning.

Reference: Procedure for Control of records IPIRTI/QP 08



8.5 Actions to address risks and opportunities (Option A)

8.5.1 Risks and opportunities associated with the laboratory activities are considered in order to:

- give assurance the management system achieve its intended results;
- enhance opportunities to achieve the purpose and objectives of the laboratory;
- prevent or reduce impacts and potential failures in the laboratory activities;
- achieve improvement.

8.5.2 The laboratory have plan to ;

- a) actions to address risks and opportunities;
- b) how to integrate and implement the actions into its management system in addition to evaluating the effectiveness of the actions

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8.5.3 Actions taken to address risks and opportunities are proportional to the potential impact on the validity of the laboratory results.

As a pro-active process to identify opportunities for improvement (rather than a reaction to the identification of process of problems or complaints), the required improvements and potential of nonconformities are identified.

When improvement opportunities are identified, or if preventive action is required, action plans are developed, implemented and monitored to reduce the likelihood of the occurrence of such nonconformities and to take advantage of the opportunities for improvement.

Requirements of actions are sourced from inputs such as internal audits, quality control reports and customer complaints.

- a) TM and HOD address the major points for action which are technical in nature. Sources of non-conformities are investigated.
- b) Existing procedures are reviewed and improved in line with the actions taken.
- c) Data is also monitored for improvement, effectiveness and reduction of nonconformities with the preventive action over a period of time.

Reference: Procedure for addressing risks and opportunities IPIRTI/QP/07.

8.6 Improvement



8.6.1 CENTEC strive for continual improvement of the effectiveness of the management system through the use of the following:

- Review of Quality Policy,
- Review of Quality objectives,
- Results of internal and external audits,
- Analysis of data,
- Corrective and preventive actions, and
- Management reviews.

Opportunities for improvement are identified, selected and the necessary actions are implemented

8.6.2 Feedback is sought from customers, analysed and used to improve the management system, laboratory activities and customer service.

The complaints received, if any, from the customer are treated as a step towards further improvement in the functioning of the laboratory and avoiding the lapses identified, if any, in

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its operation. The non-conformities reported either in the form of NCRs or observations made by the auditors are given due importance and attention and immediately acted upon. The laboratories maintains the data in respect of the various tests carried out and evaluates fulfillment of its quality policy related to:

- a) The promptness in carrying out the tests
- b) The reliability and consistency of the test results
- c) Satisfaction of its customers for the test services rendered
- d) The promptness and effectiveness of the communication of the test results to its internal/ external customers.

Lab is maintaining corrective and preventive actions file for improvement

8.7 Corrective action

Corrective actions are initiated in accordance with the established procedure when non-conformances are identified in the testing activities or departures from the policies and procedures in the management system or technical operations.

8.7.1 When a nonconformity occurs, the laboratory:

a) react and take appropriate actions to control and correct the nonconformity and address the consequences;

b) evaluate the need for action to eliminate the cause(s) of nonconformity in order that it does not recur or occur elsewhere. The procedure for corrective action starts with an investigation to determine the root causes of the problem.

c) Selection and implementation of corrective actions



Suitable corrective actions to overcome the non-conformances are initiated. Root cause of the problem is identified wherever possible and corrections are made to eliminate the root cause. Actions are appropriate to the magnitude of the problem and commensurate with risks involved.

;

d) review the effectiveness of any corrective action taken; Any changes resulting from corrective action investigations are documented and implemented, and suitable records maintained.

e) update risks and opportunities determined during planning; Principally the HOD and the TM monitor the corrective actions for effective control.

f) make changes to the management system, if required.

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8.7.2 Corrective actions are checked to be appropriate to the effects of the nonconformities encountered. Acceptance of test results with deviations (with respect to laid down specification/procedure) is only with the permission from the customer.

Re-sampling and repeat testing is resorted to if required.

Where identification of nonconformance or departures casts doubts on the laboratory's compliance with its policies and procedures, CENTEC ensures that the appropriate areas of activity are subjected to audits as per 4.14 as soon as possible. Such audits follow the implementation of the corrective actions to assess their effectiveness. An additional audit is initiated when serious issues or risk to the business is identified.

8.7.3 Records are retained as evidence of: a) the nature of the nonconformities, cause(s) and any actions taken; b) the results of corrective action.

Reference: Procedure for corrective actions IPIRTI/QP/06

8.8 Internal audits



The purpose of internal audit is to ensure effective planning and implementation of management systems.

Method

- a) The Quality Manager is responsible for planning and implementing the internal quality audits addressing all elements of the management system, including testing and calibration activities. The audits are conducted at least once a year, each audit cycle covers all areas at least once in a year. However, the special audits may be conducted as felt necessary due to situations like introduction of a new area/ or organizational changes are made or new equipment/personnel is inducted.
- b) After the completion of the audit, the auditor prepares reports stating clearly the observation and attribution, wherever discrepancy is observed.
- c) Nonconformity reports are initiated on the NCR format.
- d) The head of the department being audited endorses the proposed corrective actions and proposed date for completion. The NCRs are retained by the HOD.

Post Audit Action

- The HODs and the AO are responsible for taking timely corrective action on the deficiencies found during the audit within the period mentioned in the report.
- After implementation of corrective action, H.O.D. /AO records the action.

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- The area audited, the audit findings and the corrective actions taken are recorded.

Summary Of Internal Quality Audits

QMR prepares a summary report for discussion in the Management Review, and is a useful tool for any continual improvement.

Follow Up Audit Activities

The HOD/AO verifies the effectiveness of corrective action taken. In case the corrective action is effective, the NCR is closed.

Reference: Procedure for carrying out internal audits IPIRTI/QP 09.

8.9 MANAGEMENT REVIEWS



8.9.1 Laboratory management reviews its management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness, including the stated policies and objective related to the fulfilment of the Standard.

Management review M.R. is conducted once in a year and usually after internal audit. The M.R. meetings discuss and take account of

- changes in relevant internal and external issues;
 - fulfilment of objectives;
 - suitability of policies and procedures;
 - status of actions from previous management reviews;
 - outcomes of recent internal audits;
 - corrective actions;
 - assessments by external bodies;
 - changes in the volume or in the range of laboratory activities;
 - customer and personal feedback;
 - complaints;
 - effectiveness of any implemented improvements;
 - adequacy of resources;
 - results of risk identification;
 - outcomes of the assurance of the validity of results;
 - The Other relevant factors, such as quality control activities, resources and staff training.
- The findings are recorded and actions taken are discussed. The time frame is fixed for the action is taken.

PROCEDURE

- 2) Frequency: Once in a year.

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- 3) Review Team: A team chaired by the Director, IPIRTI conducts the review. The team consists of HODs/AO/TM. and any other representatives as desired by the Director.
- 4) Agenda: Quality Manager is responsible for organizing the management review, preparation of agenda for the review, which is circulated at least one week in advance to the Director and other members.

The agenda comprises of:

1. Review of actions taken on the points discussed in the previous Management review Meeting.
2. Effectiveness of implemented corrective and preventive actions.
3. Review of quality objectives
4. Recent internal and external audit reports.
5. Customer feedback including complaints,
6. Review of performance against set quality objectives.
7. Training requirements/progress on training activities.
8. Resources requirements for effective operations of Quality System.
9. Action plan, responsibilities and time schedule.
10. Results of inter laboratory comparisons.
11. Changes in volume as well as scope of work.
12. Recommendations for improvement.

Action Plan

During the Management Review meeting if any, deficiencies are identified. The Management Review team identify, as appropriate, plans for further action, responsibilities and time schedules for implementing.

Minutes of the Meeting

QMR prepares and circulates the minutes of the meeting to all members and all concerned personnel within a week's time. The Director before circulation endorses this Minutes of the Meeting.



QMR is responsible for maintaining records of Management Review Meetings.

8.9.3 The outputs from the management review must record all decisions and actions related to: a) the effectiveness of the management system and its processes; b) improvement of the laboratory activities related to the fulfilment of the requirements of the Standard; c) provision of required resources; d) any need for change.

Follow Up



HOD/TM/QMR are responsible for follow up actions after the review.

Reference: Procedure for Management reviews IPIRTI/QP 10.

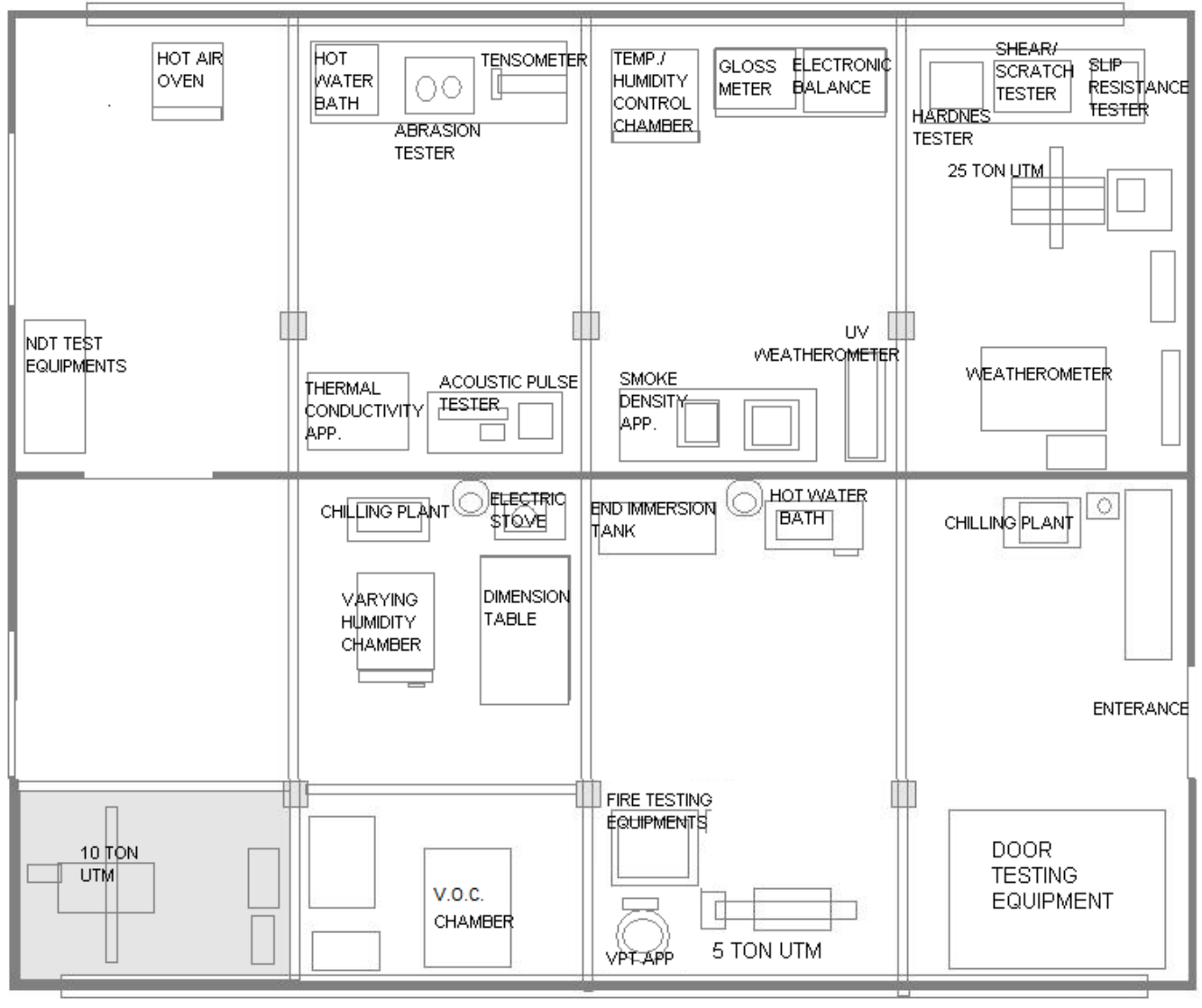
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LIST OF QUALITY PROCEDURES



QP. No.	TITLE
IPIRTI/QP 01	<i>Document control</i>
IPIRTI/QP 02	<i>Review of requests, tenders and contracts</i>
IPIRTI/QP 03	<i>Purchasing services and supplies</i>
IPIRTI/QP 04	<i>Complaints</i>
IPIRTI/QP 05	<i>Control of non conforming testing</i>
IPIRTI/QP 06	<i>Corrective actions</i>
IPIRTI/QP 07	<i>Preventive actions</i>
IPIRTI/QP 08	<i>Control of records</i>
IPIRTI/QP 09	<i>Internal audit</i>
IPIRTI/QP 10	<i>Management reviews</i>
IPIRTI/QP 11	<i>Personnel</i>
IPIRTI/QP 13	<i>Safe handling, transport, maintenance of equipment</i>
IPIRTI/QP 14	<i>Metrological Traceability</i>
IPIRTI/QP 16	<i>Handling of test items</i>
IPIRTI/QP 17	<i>Assuring the quality of test calibration results</i>
IPIRTI/QP 18	<i>Tests methods/ Procedures</i>
IPIRTI/QP 19	<i>Estimation of uncertainty of measurement</i>

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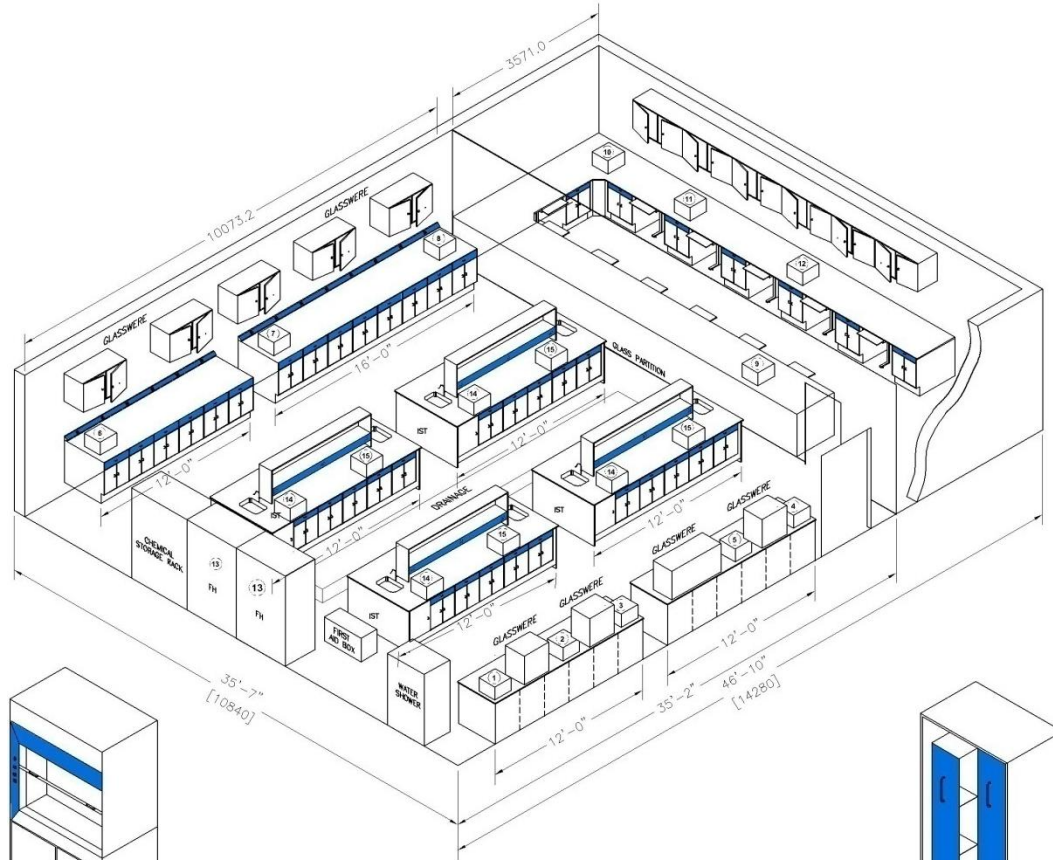
LAB LAYOUT: MECHANICAL LAB



Contd.



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LAB LAYOUT: CHEMICAL LAB

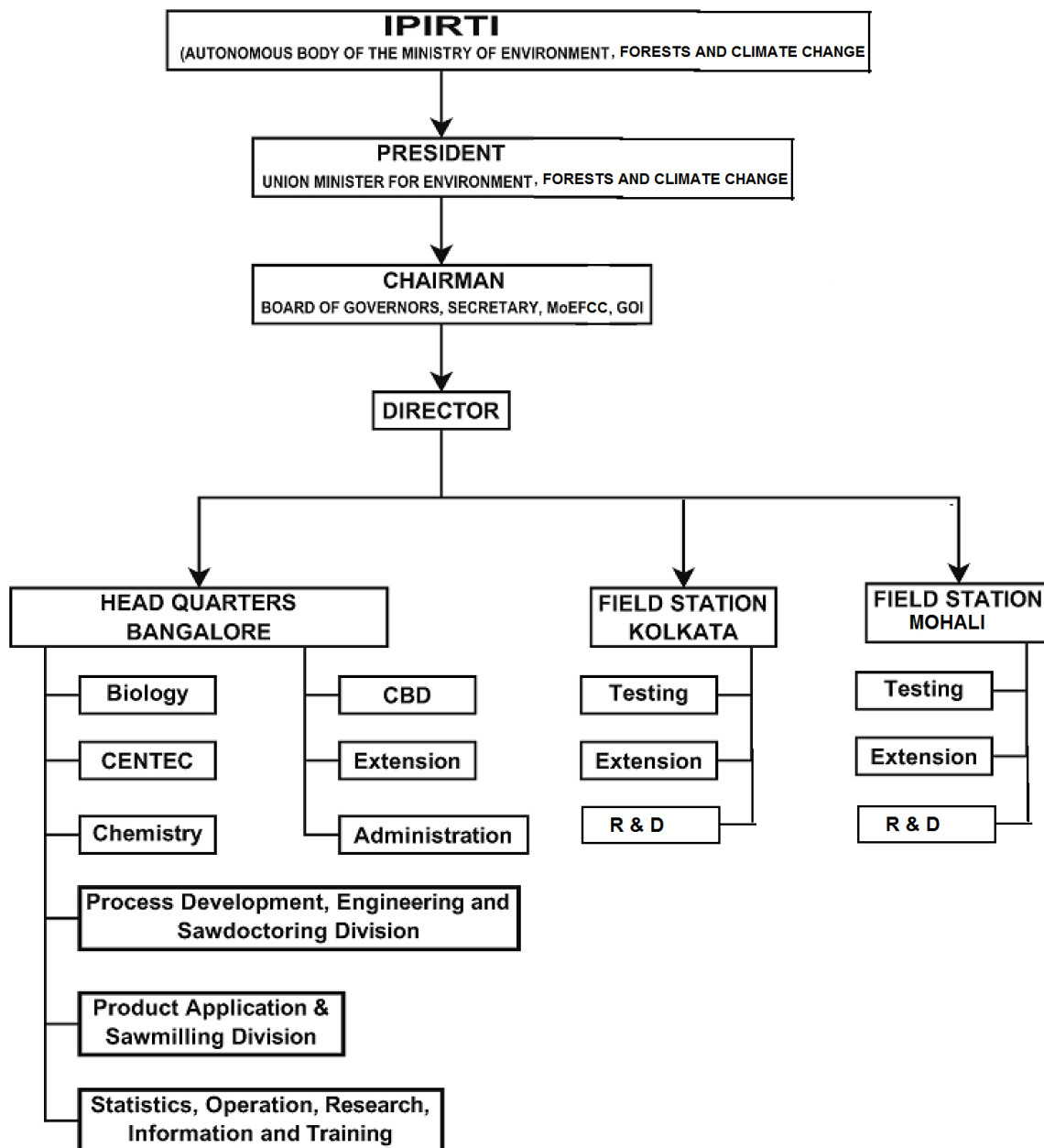




LEGEND

ITEM NO.	DESCRIPTION
1	MUFFLE FURNACE
2	OVEN
3	WEIGHING BALANCE
4	TENSOMETER
5	VISCOMETER
6	HOT WATER BATH
7	EXTRACTION UNIT
8	DIGESTOR
9	HIGH POWER LIQUID CHROMATOGRAPHY (HPCL)
10	ATOMIC ABSORPTION SPECTROSCOPY (AAS)
11	ELECTRONIC BALANCE
12	DIFFERENTIAL SCANNING COLORIMETER (DSC)
13	HOOD CHAMBER
14	RESIN REACTOR
15	ANALYSIS TABLE

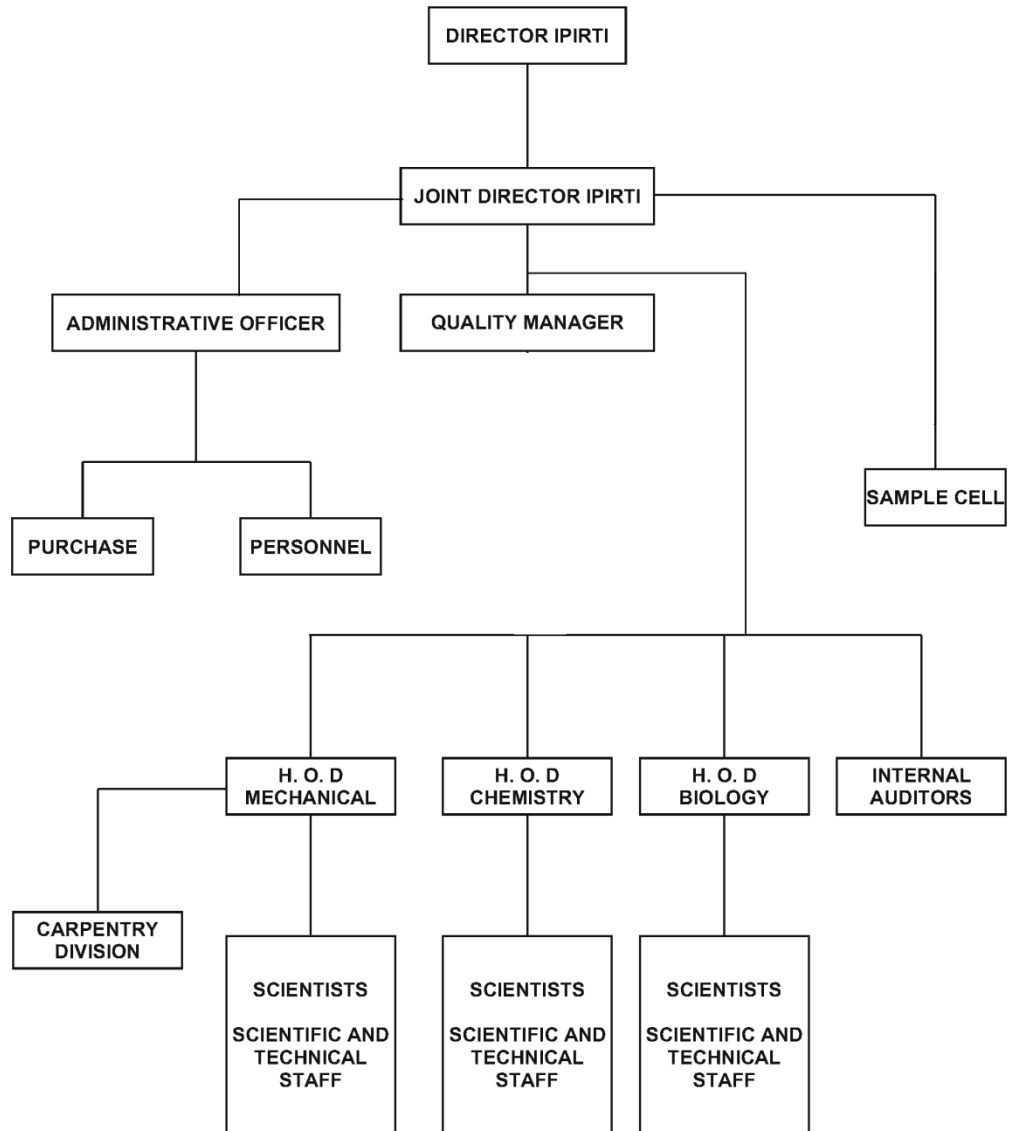
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Organization structure of IPIRTI



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